CLAIMS

1. A method of allocating a temporary identity (TLLI) in a cellular network to a mobile station (MS) by a first network element (SGSN, BSC, RNC) which has an identifier of its own, characterized in that the temporary identity (TLLI) comprises at least part of an identifier (NEI) indicating the first network element.

2. A method according to claim 1, characterized in that the temporary identity also comprises a paging identity which is unique to each mobile station in the paging area in question.

3. A method according to claim 1 or 2, characterized in that the identifier (NEI) of the first network element together with an identifier (RAI) of the paging area where said temporary identity was allocated uniquely identifies the first network element.

4. A method according to any one of the preceding claims, characterized in that

the cellular network comprises a plurality of paging areas, each paging area having an associated master network element for allocating a paging identity to each of several mobile stations in the paging area; and

the first network element, before allocating the temporary identity to a paging area, requests a paging identity for the mobile station from said master network element in the paging area in question.

5. A method according to any one of the preceding claims, characterized in that the cellular network comprises a plurality of paging areas, each of which is connected to a plurality of network elements, and that the cellular network uses said temporary identity for routing uplink traffic to the network element currently serving the mobile station (MS).

6. A method according to any one of the preceding claims, characterized in that the cellular network comprises a plurality of paging areas, and that after a change to a new paging area by the mobile station (MS), a network element to which the mobile station is registered uses said temporary identity and the identifier of the new paging area for deriving an identifier of a network element which served the mobile station before said change.

7. A method according to any one of claims 2 to 6, characterized in that only said paging identity is used at first for paging the mobile station, and that the entire temporary identity is used for signalling.

8. A network element, preferably a support node (SGSN) for a cellular network, adapted to allocate a temporary identity (TLLI) to a mobile station (MS), characterized in that said temporary identity comprises at least a part, preferably 3 to 5 bits, of an identifier (NEI) indicating the network element that allocates the temporary identity.

9. A network element according to claim 8, characterized by being adapted to use said temporary identity (TLLI) and the identifier of the paging area where the mobile station (MS) is located to derive an identifier of another network element which served the mobile station prior to the current network element.

10. A network element according to claim 8 or 9, characterized in that said temporary identity also comprises a paging identity which is unique to each mobile station (MS) in the paging area in question.

11. A cellular network, characterized by a network element according to any one of claims 8 to 10.

12. A cellular network according to claim 11, characterized by a database element, preferably a domain name server (DNS), which is adapted to:

- receive an inquiry comprising said at least part of the identifier of the network element that allocates the temporary identity and information relating to the location where the temporary identity was allocated, such as a paging area identifier; and to

- unambiguously determine, on the basis of said inquiry, an address of the network element which allocated the temporary identity.

13. A cellular network according to claim 12, characterized in that the database element (DNS) is also adapted to send an inquiry to another network element currently storing a context for the mobile station (MS) in question.

14. A mobile station (MS) for a cellular network, being adapted to use a temporary identity (TLLI) allocated by a network element, characterized in that said temporary identity comprises at least a part, preferably 3 to 5 bits, of the identifier of the network element (SGSN) that allocates the temporary identity.

15. A mobile station (MS) according to claim 14, characterized by being adapted to use the temporary identity in connection with at least one of the following procedures:

- cell update,
- routing area update,
- location area update,
- paging area update, and
- paging response.

16. A mobile station (MS) according to claim 14 or 15, characterized by being adapted to:

use a part of the identifier of the network element (SGSN) that allocates the temporary identity for data transfer; and to

use the identifier in full for signalling.

~~17~~. A radio station controller, preferably a Base Station Controller (BSC) or a Radio Network Controller (RNC), for a cellular network, adapted to route data packets comprising a temporary identity allocated to a mobile station (MS), characterized in that

the temporary identity comprises at least part, preferably 3 to 5 bits, of an identifier (NEI) indicating a first network element which allocated the temporary identity; and

the radio station controller is adapted to use said at least part of the identifier for routing data packets to said first network element currently serving the mobile station.

18. A radio station controller according to claim 17, characterized by comprising, for each of several mobile stations, a context for temporarily storing an identifier of the network element currently serving the mobile station.

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